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EXAMINER

ILDEBRANDO, CHRISTINA A

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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1754

6

DATE MAILED: 09/05/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/833,603

Examiner

Christina Ildebrando

Applicant(s)

CHENG ET AL.

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MF-5

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 April 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: on page 7, paragraph 3, the disclosure refers to values "in Table 1 below." However, there is no Table 1 on page 7. There is a Table 1 on page 15a. It is not clear whether this is the Table referred to on page 7 or another Table, i.e. Table 2.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-20, 23-24, 29/23, 29/24, 30/23, 30/24, and 31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3. Claim 1 recites groups of compounds in improper Markush format. This limitation renders the claim indefinite because it is improper to use the term "consisting essentially of" instead of "consisting of." Refer to MPEP 2173.05(h).

4. Claims 5-7 recite the limitation "wherein the zeolite is present in from 70." It is suggested that applicant amend the claim to recite "wherein the zeolite is present in amounts in the range of..." to clarify what is being claimed.

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5. Claim 8 recites the limitation "wherein the zeolite is selected from a Y zeolite."

This limitation renders the claim indefinite because only 1 species is recited, i.e. Y zeolite. It is not clear what is being "selected."

6. Claims 23-24 recite the limitation "wherein the zeolite is selected from a Y type zeolite." This limitation renders the claim indefinite because only 1 species is recited, i.e. Y type zeolite. It is not clear what is being selected.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-9, 15-17, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Wachter et al.

Wachter et al. (US 6,022,471) discloses a FCC catalyst composition. It is taught that the catalyst composition comprises a matrix material having dispersed therein an aluminosilicate zeolite (column 2, lines 39-43). The matrix material is a silica sol (column 2, lines 45-46). Suitable zeolites include zeolite Y, which is preferably exchanged with rare earth cations, i.e. a REY zeolite (column 3, lines 1-25). It is taught by the reference that the amounts of zeolite component in the totally catalyst will generally range from about 1 to 80 percent, preferably 5 to 70 percent, by weight of the catalyst (column 3, lines 35-40). The catalyst composition is shaped to form

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microspheres having an average particle diameter in the range of about 10-200 microns, preferably 60-100 microns (column 4, lines 60-65).

The reference does not disclose the specific properties claimed, i.e. kinetic conversion activity, Davison attrition Index, and H₂O pore volume. However, the reference teaches the use of the same materials in amounts falling within the ranges instantly claimed. Therefore, it is the position of the examiner that such properties would inherently be present in the prior art composition. When the examiner has reason to believe that the functional language asserted to be critical for establishing novelty in claimed subject matter may in fact be an inherent characteristic of the prior art, the burden of proof is shifted to Applicants to prove that the subject matter shown in the prior art does not possess the characteristics relied upon. *In re Fitzgerald et al.* 205 USPQ 594.

As each and every element of the claimed invention is taught in the prior art as recited above, the claims are anticipated by Wachter et al.

9. Claims 1-31 are rejected under 35 U.S.C. 102(b) as being anticipated by Kumar et al.

Kumar et al. (US 5,079,202) discloses FCC catalysts which comprises a zeolite component and an inorganic oxide matrix which contains pollucite (column 1, lines 49-51). Suitable zeolites include Y zeolites, preferably USY and CREY (column 2, lines 5-10). Suitable matrix materials include alumina and silica sols (column 2, lines 10-14). It is taught that the catalyst composition contains 5-70 weight percent zeolite (column 1, lines 60-64). It is taught that the catalyst has a particle size range of 20-150 microns

and an attrition index of 0-30 (column 2, lines 40-52). With regards to claims 20-31, Kumar et al. teaches that the catalyst composition may be combined with a FCC cesium additive to minimize the production of contaminants and coke (column 2, lines 50-60). Such an additive is considered to meet the second particulate material as claimed.

The reference does not disclose the specific properties claimed, i.e. kinetic conversion activity and H₂O pore volume. However, the reference teaches the use of the same materials in amounts falling within the ranges instantly claimed. Therefore, it is the position of the examiner that such properties would inherently be present in the prior art composition. When the examiner has reason to believe that the functional language asserted to be critical for establishing novelty in claimed subject matter may in fact be an inherent characteristic of the prior art, the burden of proof is shifted to Applicants to prove that the subject matter shown in the prior art does not possess the characteristics relied upon. *In re Fitzgerald et al.* 205 USPQ 594.

As each and every element of the claimed invention is taught in the prior art as recited above, the claims are anticipated by Kumar et al.

10. Claims 1-8, 15-16, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Connolly et al.

Connolly et al. (US 5,120,693) discloses agglomerates of zeolitic molecular sieves which are bound with a silica binder (column 2, lines 55-65). It is taught that the silica binder constitutes 10-20 weight percent and the zeolite constitutes from about 50-90 percent by weight of the composition (column 3, lines 1-10). Suitable zeolites include zeolite Y (column 4, lines 20-21). Suitable binders include silica sols (column 4, lines

45-46). The composition has a particle size in the range of 40-800 microns, preferably 100-600 microns (column 2, lines 59-60).

The reference does not disclose the specific properties claimed, i.e. kinetic conversion activity, Davison attrition Index, and H₂O pore volume. However, the reference teaches the use of the same materials in amounts falling within the ranges instantly claimed. Therefore, it is the position of the examiner that such properties would inherently be present in the prior art composition. When the examiner has reason to believe that the functional language asserted to be critical for establishing novelty in claimed subject matter may in fact be an inherent characteristic of the prior art, the burden of proof is shifted to Applicants to prove that the subject matter shown in the prior art does not possess the characteristics relied upon. *In re Fitzgerald et al.* 205 USPQ 594.

As each and every element of the claimed invention is taught in the prior art as recited above, the claims are anticipated by Connolly et al.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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12. Claims 3-4, 15/3, and 15/4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wachter et al. as applied above for claims 1-9, 15-17, and 20 above, and further in view of Chester et al.

Wachter et al. is applied as above for claims 1-9, 15-17, and 20 above. With regards to the pore volume and attrition index values claimed, it is the position of the examiner that such properties, given that the reference teaches the use of the same materials in the same amounts, would be inherent in the composition taught by the reference. However, if it is considered that the properties are not inherently present in the prior art, then it is the position of the examiner that such claims would be obvious in light of the teachings of Chester et al. If the prior art does not in fact anticipate the instant claims, then the claims would have been obvious to one of ordinary skill in the art. *Ex parte Lee*, 31 USPQ 2d. 1105.

In this case, Chester et al. (US 4,442,223) teaches that the pore volume and attrition resistance of an FCC catalyst are important parameters (column 4, lines 35-40 and column 4, lines 60-62). It is specifically taught that for a given type of catalyst attrition resistance increases with increasing density and decreasing pore volume; while low pore volumes are desirable, too low a pore volume can lead to selectivity losses due to diffusional restrictions (column 4, lines 60-69). It is taught that for an FCC catalyst the pore volume is typically in the range of 0.30-0.45 cc/gm (H₂O) (column 5, lines 1-5).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to choose the instantly claimed ranges through process

optimization, since it has been held that there the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. See *In re Boesch*, 205 USPQ 215. In this case, the secondary reference to Chester et al. establishes that the properties are result effective variables for FCC catalyst compositions, providing one of ordinary skill with motivation to optimize such variables to achieve the best results from the catalyst.

13. Claims 10 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wachter et al. as applied above for claims 1-9, 15-17, and 20 above, and further in view of Herbst et al.

The teachings of Wachter et al. are applied as above for claims 1-9, 15-17, and 20.

Wachter et al. does not teach the use of a CREY zeolite, as required by claim 10.

Herbst et al. (US 5,055,437) teaches that conventional FCC catalysts usually contain zeolites such as REY, DAY, USY, and REUSY (column 2, lines 15-20).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the invention of Wachter et al. in light of the disclosure of Herbst et al. Herbst et al. teaches the suitability of CREY as a catalyst in FCC processes and further teaches its equivalence to the rare earth exchanged zeolite Y compositions taught by Wachter et al. Because of the art recognized functional equivalence of the CREY zeolite to the zeolites taught by Wachter et al. in FCC processes, it would have been obvious to one of ordinary skill to have substituted one known component for the other in the catalyst taught by Wachter et al.

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14. Claims 21-26, 30, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wachter et al. as applied above for claims 1-9, 15-17, and 20 above, and further in view of Rheume et al.

The teachings of Wachter et al. are applied as above for claims 1-9, 15-17, and 20.

Wachter et al. does not teach a catalyst composition comprising a second particulate material, as require by claim 21.

Rheume et al. (US 4,918,036) teaches a FCC catalyst composition comprising a cracking component such as a Y zeolite in combination with a SO_x gettering agent (column 5, line 50 – column 6, lines 10). It is taught that such a combination is advantageous to eliminate undesirable emissions of SO_x from flue gases of FCC/combustion units (columns 1-2).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the invention of Wachter et al. to include the use of a SO_x gettering agent as taught by Rheume et al. in light of the advantages associated therewith, i.e. decreased SO_x emissions. Because both catalysts are used in FCC processes, one would have reasonable expectation of success from the combination. With regards to the kinetic conversion activity instantly claimed, as discussed above, it is considered that because the prior art teaches the use of the same materials in the same amounts recited in the instant claims, the kinetic conversion activity of the prior art would also be the same.

15. Claims 27-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wachter et al. in view of Rheume et al. as applied to claims 21-26 and 30-31 above, and further in view of Herbst et al.

Wachter et al. in view of Rheume et al. is applied as above for claims 21-26 and 30-31.

The modified disclosure of Wachter et al. further does not teach the use of a CREY zeolite, as required by claims 27 and 28.

Herbst et al. (US 5,055,437) teaches that conventional FCC catalysts usually contain zeolites such as REY, DAY, USY, and REUSY (column 2, lines 15-20).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have further modified the invention of Wachter et al. in light of the disclosure of Herbst et al. Herbst et al. teaches the suitability of CREY as a catalyst in FCC processes and further teaches its equivalence to the rare earth exchanged zeolite Y compositions taught by Wachter et al. Because of the art recognized functional equivalence of the CREY zeolite to the zeolites taught by Wachter et al. in FCC processes, it would have been obvious to one of ordinary skill to have substituted one known component for the other in the catalyst taught by Wachter et al.

16. Claims 3-4, 11/3, 11/4, 15/3, and 15/4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kumar et al. as applied above for claims 1-31 above, and further in view of Chester et al.

Kumar et al. is applied as above for claims 1-31 above. With regards to the pore volume and attrition index values claimed, it is the position of the examiner that such

properties, given that the reference teaches the use of the same materials in the same amounts, would be inherent in the composition taught by the reference. However, if it is considered that the properties are not inherently present in the prior art, then it is the position of the examiner that such claims would be obvious in light of the teachings of Chester et al. If the prior art does not in fact anticipate the instant claims, then the claims would have been obvious to one of ordinary skill in the art. *Ex parte Lee*, 31 USPQ 2d. 1105.

In this case, Chester et al. (US 4,442,223) teaches that the pore volume and attrition resistance of an FCC catalyst are important parameters (column 4, lines 35-40 and column 4, lines 60-62). It is specifically taught that for a given type of catalyst attrition resistance increases with increasing density and decreasing pore volume; while low pore volumes are desirable, too low a pore volume can lead to selectivity losses due to diffusional restrictions (column 4, lines 60-69). It is taught that for an FCC catalyst the pore volume is typically in the range of 0.30-0.45 cc/gm (H₂O) (column 5, lines 1-5).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to choose the instantly claimed ranges through process optimization, since it has been held that there the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. See *In re Boesch*, 205 USPQ 215. In this case, the secondary reference to Chester et al. establishes that the properties are result effective variables

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for FCC catalyst compositions, providing one of ordinary skill with motivation to optimize such variables to achieve the best results from the catalyst.

Conclusion


17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christina Ildebrando whose telephone number is (703) 305-0469. The examiner can normally be reached on Monday-Friday, 7:30-5, with Alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on (703) 308-3837. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0651.

CAI
September 3, 2002


Stanley S. Silverman
Supervisory Patent Examiner
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